

ARTIFICIAL KEYS
— TO —
THE NATURAL ORDERS
— OF A —
FLORA
— OF THE —
MIAMI VALLEY, OHIO.

— BY —
A. P. MORGAN.

BPL
QK180
M85
1881

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J. W. JOHNSON, DAYTON, OHIO,
1881.

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THE VEGETABLE KINGDOM.

PHÆNOGAMS OR FLOWERING PLANTS.

Plants having flowers with stamens and pistil (*a*)

- a.* Ovules produced in a closed ovary (*b*)
 - b.* Cotyledons two ; leaves netted-veined (*c*)
 - c.* Corolla present (*d*)
 - d.* Petals distinct I.
 - d.* Petals united II.
 - c.* Corolla absent III.
 - b.* Cotyledon one ; leaves parallel-veined IV.
- a.* Ovules produced upon an open scale V.

CRYPTOGAMS OR FLOWERLESS PLANTS.

Plants not having flowers with stamens and pistil (*e*)

- e.* Leafless plants ; stems hollow and jointed VI.
- e.* Leafy plants, the leaves called fronds VII.

I. POLYPETALOUS DICOTYLEDONS.

Series 1. **Thalamifloræ.**

Series 2. **Discifloræ.**

Series 3. **Calycifloræ.**

II. GAMOPETALOUS DICOTYLEDONS.

Series 1. **Inferæ.**

Series 2. **Superæ.**

III. APETALOUS DICOTYLEDONS.

IV. MONOCOTYLEDONS.

V. CONIFERÆ. Evergreen trees or shrubs,

VI. EQUISETACEÆ. Scouring Rushes.

VII. FILICES. Ferns.

I. POLYPETALOUS DICOTYLEDONS.

SERIES I.—THALAMIFLORÆ.

* *Stamens indefinite.*Petals six or more (*a*)*a.* Sepals two or three (*b*)*b.* Trees or shrubs 2, 3*b.* Herbs 8.*a.* Sepals four or more (*c*)*c.* Plants not aquatic 4, 5*c.* Plants aquatic 6Petals five or less (none 1) (*d*)*d.* Sepals five (*e*)*e.* Leaves alternate or radical (*f*)*f.* Stamens distinct 1, 7*f.* Stamens united or in sets 17, 18*e.* Leaves opposite 16*d.* Sepals less than five (*g*)*g.* Sepals two or three 8, 15*g.* Sepals four 11** *Stamens definite.*Stamens six or more (*h*)*h.* Petals five or more 5, 14*h.* Petals four or less (*i*)*i.* Flowers regular 10*i.* Flowers irregular 9, 13

Stamens five 12, 15

1. **Ranunculaceæ.** Leaves flat; petals often wanting, sometimes stamen-like; carpels few—many, rarely one.
2. **Magnoliaceæ.** Trees; leaves with stipules.
3. **Anonaceæ.** Shrubs or small trees; leaves without stipules.
4. **Menispermaceæ.** Woody climbers; leaves alternate.
5. **Berberidaceæ.** Herbs from rootstocks; leaves lobed or compound.
6. **Nymphæaceæ.** Leaves and flowers from a thick rootstock.
7. **Sarraceniaceæ.** Leaves pitcher-form.
8. **Papaveraceæ.** Herbs with a colored juice; leaves lobed.
9. **Fumariaceæ.** Leaves ternately dissected; sepals 2, small.
10. **Cruciferæ.** Flowers cruciform, sepals 4, petals 4, stamens tetradynamous.
11. **Capparidaceæ.** Strong-scented herbs, viscid-hairy.
12. **Violaceæ.** Flowers irregular, sepals 5, petals 5.
13. **Polygalaceæ.** Leaves simple, entire; sepals 5, the two lateral large and petaloid.
14. **Caryophyllaceæ.** Leaves opposite, entire; petals mostly 5, stamens mostly 10.
15. **Portulacaceæ.** Leaves simple, entire; flowers regular.
16. **Hypericaceæ.** Leaves punctate with black or pellucid dots.
17. **Malvaceæ.** Herbs; stamens monadelphous.
18. **Tiliaceæ.** Trees; stamens 5-adelphous.

I. *POLYPETALOUS DICOTYLEDONS.*SERIES II. *DISCIFLORÆ.** *HERBS I, 2.** * *TREES OR SHRUBS.*Leaves simple (*a*)*a.* Leaves alternate (*b*)*b.* Shrubs climbing 4, 6*b.* Shrubs not climbing 5*a.* Leaves opposite 4, 7Leaves compound (*c*)*c.* Leaves alternate (*d*)*d.* Shrubs not climbing 3, 8*d.* Shrubs climbing 6, 8*c.* Leaves opposite 7

1. **Linaceæ.** Leaves simple, entire, sessile; sepals 5, petals 5, stamens 5.
2. **Geraniaceæ.** Leaves simple or compound, petiolate.
3. **Rutaceæ.** Leaves with pellucid dots; fruit a pod or a samara; seeds 2.
4. **Celastraceæ.** Shrubs erect or twining; leaves simple; undivided.
5. **Rhamnaceæ.** Stamens 4 or 5, opposite the petals.
6. **Vitaceæ.** Shrubs climbing by tendrils, which are opposite the leaves.
7. **Sapindaceæ.** Leaves palmately lobed or compound.
8. **Anacardiaceæ.** Shrubs erect or climbing by rootlets; leaves not dotted; fruit a dry drupe.

I. POLYPETALOUS DICOTYLEDONS.

SERIES III. CALYCIFLORÆ.

FLOWERS IRREGULAR 1

FLOWERS REGULAR (A)

A. STAMENS INDEFINITE 2

A. STAMENS DEFINITE.

* *Stamens an odd number.*

Flowers not in umbels (a)

a. Plants not climbing 3, 6

a. Plants climbing by tendrils 10, 11

Flowers in umbels (b)

b. Petals none 12

b. Petals five 13, 14

* * *Stamens an even number.*

Herbs (c)

c. Styles distinct (d)

d. Styles two 3

d. Styles four or five 4, 6

c. Styles united (e)

e. Calyx free from the ovary 8

e. Calyx adnate to the ovary 7, 9

Shrubs or trees (f)

f. Leaves dentate 3, 5

f. Leaves entire 15

1. **Leguminosæ.** Leaves alternate, mostly compound; flowers papilionaceous, stamens 10 monadelphous or diadelphous (9 and 1) rarely distinct.
2. **Rosaceæ.** Leaves alternate, with stipules; stamens numerous, perigynous.
3. **Saxifragaceæ.** Shrubs or herbs.
4. **Crassulaceæ.** Calyx free, carpels four or five.
5. **Hamamelaceæ.** Shrubs with simple, alternate leaves.
6. **Haloragaceæ.** Aquatic or marsh plants.
7. **Melastomaceæ.** Leaves opposite 3—5-nerved.
8. **Lythraceæ.** Petals and stamens on the throat of the calyx.
9. **Onagraceæ.** Leaves alternate or opposite; flowers 2—4-merous.
10. **Passifloraceæ.** Calyx with a crown of filaments in the throat.
11. **Cucurbitaceæ.** Petals united at the base.
12. **Ficoideæ.** Prostrate much branched herbs; leaves entire, apparently verticillate; flowers in an umbellate cyme; calyx free.
13. **Umbelliferæ.** Herbs, leaves alternate, styles two, fruit dry, seeds two.
14. **Araliaceæ.** Styles mostly five, fruit a berry, seeds mostly five.
15. **Cornaceæ.** Flowers in cymes, style single, fruit a drupe.

II. GAMOPETALOUS DICOTYLEDONS.

SERIES I. INFERÆ.

* *SHRUBS.*

Flowers not in heads 1

Flowers in globose heads 2

* * *HERBS.*

Leaves opposite or whorled (*a*)

a. Flowers not in heads (*b*)

b. Stamens five 1

b. Stamens four or less 2, 3

a. Flowers in heads 4, 5

Leaves alternate (*c*)

c. Flowers in heads 5

c. Flowers not in heads 6, 7

1. **Caprifoliaceæ.** Mostly shrubs; stipules none or if present not interpetiolar.
2. **Rubiaceæ.** Mostly herbs; leaves entire, stipules interpetiolar; stamens 4.
3. **Valerianaceæ.** Stipules none; flowers in cymes; stamens 3.
4. **Dipsaceæ.** Corolla 4-cleft; stamens 4, distinct.
5. **Compositæ.** Corolla 5-lobed; stamens 5, their anthers united in a tube.
6. **Lobeliaceæ.** Corolla irregular, split down on one side; stamens monadelphous.
7. **Campanulaceæ.** Corolla regular; stamens distinct.

II. GAMOPETALOUS DICOTYLEDONS.

SERIES II. SUPERÆ.

* TREES OR SHRUBS.

Leaves alternate 1, 3

Leaves opposite 4, 16

* * HERBS.

Plants climbing 6, 11

Plants not climbing (*a*)*a. Stamens five or more (b)**b. Stamens more than five 1, 2**b. Stamens five (c)**c. Stamens opposite the petals 2**c. Stamens alternate (d)**d. Style cleft (e)**e. Style trifid 8**e. Style bifid 7, 9**d. Style entire (f)**f. Ovaries two 5, 6**f. Ovary one (g)**g. Seeds four 10**g. Seeds numerous 12, 13**a. Stamens four or less (h)**h. Plants without green foliage 14**h. Plants with green foliage (i)**i. Plants aquatic 15**i. Plants not aquatic (k)**k. Leaves opposite (l)**l. Corolla regular 7**l. Corolla irregular (m)*

- m.* Seeds numerous, indefinite 13, 17
- m.* Seeds few and definite (*n*)
- n.* Fruit a 2-celled pod 18
- n.* Fruit 1-seeded nutlets 19, 20
- k.* Leaves all radical 21

1. **Ericaceæ.** Flowers perfect, stamens 8-10, ovary 4-10 celled, style undivided.
2. **Primulaceæ.** Flowers regular; stamens 5-7 opposite the lobes of the corolla.
3. **Ebenaceæ.** Flowers diœcious; calyx 4-parted, corolla 4-lobed; stamens 16; styles 4, each 2-lobed.
4. **Oleaceæ.** Flowers appearing in early spring, small; fruit a samara.
5. **Apocynaceæ.** Plants with milky juice; no crown; filaments distinct.
6. **Asclepiadaceæ.** Plants with milky juice; a crown of five hoods or parts between the corolla and the stamens; filaments united.
7. **Gentianaceæ.** Leaves opposite, simple, sessile, entire; flowers regular.
8. **Polemoniaceæ.** Flowers regular; ovary 3-celled.
9. **Hydrophyllaceæ.** Leaves alternate; flowers regular.
10. **Borraginaceæ.** Leaves alternate; flowers in scorpioid racemes.
11. **Convolvulaceæ.** Leaves alternate.
12. **Solanaceæ.** Leaves alternate; flowers regular.

13. **Scrophulariaceæ.** Corolla irregular; ovary 2-celled, the placentæ in the axis.
14. **Orobanchaceæ.** Leaves alternate; corolla irregular.
15. **Lentibulariaceæ.** Calyx 2-parted, corolla 2-lipped, spurred; stamens 2.
16. **Bignoniaceæ.** Flowers large and showy; limb of the corolla irregular.
17. **Pedaliaceæ.** Flowers large, irregular; pod with a long, incurved beak.
18. **Acanthaceæ.** Leaves entire.
19. **Verbenaceæ.** Corolla irregular; stamens included; ovary not 4-lobed.)
20. **Labiataæ.** Herbs with square stems, opposite leaves and a mint odor; corolla mostly 2-lipped; ovary deeply 4-lobed.
21. **Plantaginaceæ.** Leaves ribbed; flowers regular, 4-merous; corolla scarious.

III. APETALOUS DICOTYLEDONS.

* HERBS.

Not growing under water (*a*)

a. Leaves opposite (*b*)

b. Stigmas one or two 1, 14

b. Stigmas six 13

a. Leaves alternate (*c*)

c. Leaves without stipules (*d*)

d. Stamens five or less 2, 3

d. Stamens six or more (*e*)

e. Stigmas ten 4

e. Stigmas six or less 7, 8

c. Leaves with stipules (*f*)

f. Stipules ochreate 5

f. Stipules distinct 13, 14

Growing under water 6, 20

* * SHRUBS OR TREES.

Flowers not in aments (*g*)

g. Leaves not serrate (*h*)

h. Stamens six or more 9, 10

h. Stamens five or less 11, 12

g. Leaves serrate 14, 15

Flowers in aments (*i*)

i. Fruit one-seeded (*k*)

k. Leaves pinnate 16

k. Leaves simple 17, 18

i. Fruit a many-seeded pod 19

1. **Illecebraceæ.** Leaves entire, stipules scarious; flowers perfect.
2. **Amarantaceæ.** Flowers imperfect, calyx inclosed by a bract and two bractlets.
3. **Chenopodiaceæ.** Flowers perfect, calyx bractless.
4. **Phytolaccaceæ.** Flowers perfect, calyx 5-parted, stamens 10.
5. **Polygonaceæ.** Flowers mostly perfect, stamens 4-8, styles 2-3.
6. **Podostemaceæ.** Leaves alternate.
7. **Aristolochiaceæ.** Flowers perfect, calyx 3-lobed, stamens 6 or 12.
8. **Saururaceæ.** Flowers perfect, calyx none, stamens 6 or 7, carpels 3 or 4.
9. **Lauraceæ.** Twigs spicy and aromatic, leaves alternate, flowers diœcious.
10. **Thymeleaceæ.** Bark very tough, leaves alternate; flowers perfect, stamens 8.
11. **Loranthaceæ.** Parasites on the branches of trees; leaves opposite; flowers diœcious, stamens 3.
12. **Santalaceæ.** Branches herbaceous, leaves alternate; flowers perfect, stamens 4 or 5.
13. **Euphorbiaceæ.** Plants usually with a milky juice; flowers monœcious; ovary 3-celled, 3-lobed; styles 3, each 2-fid or multifid.
14. **Urticaceæ.** Leaves serrate, with stipules (except *Parietaria*); stamens as many as the lobes of the calyx, styles 1 or 2.

15. **Platanaceæ.** Leaves palmately lobed ; flowers in globular heads.
16. **Juglandaceæ.** Fruit with a fleshy or leathery exocarp and a hard or bony endocarp.
17. **Cupuliferæ.** Flowers monœcious ; nut in an involucre.
18. **Betulaceæ.** Flowers monœcious ; nutlets 2 or 3 under each bract.
19. **Salicaceæ.** Flowers dœcious, one under each bract ; calyx none, stigmas 2.
20. **Ceratophyllaceæ.** Leaves whorled, finely dissected.

IV. MONOCOTYLEDONS.

* *Leaves netted-veined.*

Plants climbing 5, 7

Plants not climbing 6, 10

* * *Leaves parallel-veined.*

Plants not rush-like or grass-like (a)

a. Plants not aquatic (b)

b. Ovary inferior (c)

c. Perianth irregular 2

c. Perianth regular 3, 4

b. Ovary superior (d)

d. Flowers not on a spadix 6, 9

d. Flowers on a spadix 10

a. Plants aquatic (e)

e. Perianth with petaloid segments (f)

f. Flowers from a spathe 1, 8

f. Flowers not from a spathe 14

e. Perianth none or not petaloid (g)

g. Plants with leafy stems 11, 13

g. Plant a small floating leaf 12

Rushes, Sedges or Grasses (h)

h. Perianth of six segments 15

h. Perianth none 16, 17

1. **Hydrocharidaceæ.** Flowers regular, dioecious or polygamous; ovary inferior.2. **Orchidaceæ.** Leaves alternate; perianth of six segments in two sets, one of the inner set more or less different in form from the others, is called the *labellum* or *lip*.

3. **Iridaceæ.** Leaves equitant ; perianth 6-cleft, the segments petaloid, in two sets ; stamens 3.
4. **Amaryllidaceæ.** Bulbous plants, stemless ; perianth 6-parted ; stamens 6.
5. **Dioscoreaceæ.** Plants with twining stems ; flowers in racemes.
6. **Liliaceæ.** Flowers regular , perianth with all its segments petaloid ; stamens 6 ; ovary 3-celled.
7. **Smilaceæ.** Plants climbing by a pair of tendrils on the petiole ; flowers in umbels.
8. **Pontederiaceæ.** Flowers more or less irregular, perfect ; ovary superior.
9. **Commelynaceæ.** Perianth with 3 segments herbaceous and 3 petaloid.
10. **Araceæ.** Spadix usually inclosed in a spathe.
11. **Typhaceæ.** Flowers in dense spikes or heads.
12. **Lemnaceæ.** The simplest and smallest flowering plants, the flowers and fruit seldom seen.
13. **Naiadaceæ.** Plants growing under water.
14. **Alismaceæ.** Perianth of 3 sepals and 3 petals ; carpels 3—many, more or less distinct.
15. **Juncaceæ.** RUSHES. Perianth glumaceous, persistent.
16. **Cyperaceæ.** SEDGES. Culms solid, often 3-edged ; leaves 3-ranked, with closed sheaths.
17. **Gramineæ.** GRASSES. Culms hollow, terete ; leaves 2-ranked, with open sheaths.

II. GAMOPETALOUS DICOTYLEDONS.

SERIES II. INFERÆ.

ORDER V. COMPOSITÆ.

Flowers not all ligulate (*a*)

a. Pappus of capillary bristles (*b*)

b. Bracts of the involucre not prickly (*c*)

c. Bracts imbricated in two or more series (*d*)

d. Flowers all tubular (*e*)

e. Flowers all perfect I, II.

e. Flowers not all perfect IV.

d. Flowers of the ray ligulate III, IV.

c. Bracts in a single series VIII.

b. Bracts of the involucre prickly. IX.

a. Pappus none or of awns or chaff (*f*)

f. Receptacle chaffy V. VII.

f. Receptacle not chaffy VI. VII.

Flowers all ligulate. X.

I. **VERNONIACEÆ.** Leaves alternate; receptacle naked, flowers purple; anthers sagittate at base, branches of the style subulate.

1. **Vernonia.** Heads many-flowered, corymbose.

2. **Elephantopus.** Heads 3—5-flowered, capitate.

II. **EUPATORIACEÆ.** Receptacle naked, anthers not sagittate at base; branches of the style rather terete, obtuse.

Leaves opposite 3, 4

Leaves alternate, 5, 6

3. **Eupatorium.** Heads corymbose, receptacle flat, flowers white or purplish.

4. **Conoclinium.** Heads corymbose, receptacle conical, flowers bluish.

5. **Kuhnia.** Heads paniculate, flowers cream-color.

6. **Liatris.** Heads spicate, flowers rose-purple.

III. **ASTEROIDEÆ.** Leaves alternate; receptacle naked, anthers obtuse at base.

Ray flowers yellow 7

Ray flowers not yellow 8, 9.

7. **Solidago.** Heads very small, rays very short.

8. **Aster.** Bracts of the involucre in many series, unequal.

9. **Erigeron.** Bracts of the involucre somewhat in two series, nearly equal.

IV. **INULOIDEÆ.** Leaves alternate, receptacle naked, anthers caudate at base.

Ray flowers none (*a*)

a. Flowers purplish 10

a. Flowers whitish 11, 12

Ray-flowers present 13

10. **Pluchea.** Strong scented herbs; heads with the outer flowers fertile, the inner sterile.

11. **Antennaria.** White-woolly herbs; heads dioecious.

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22. **Lepachys.** Achenium flattened.
23. **Helianthus.** Awns caducous, achenium 4-sided.
24. **Actinomeris.** Awns persistent, achenium flat.
25. **Coreopsis.** Awns upwardly barbed.

MAIN STACKS

26. **Bidens.** Awns downwardly barbed.
- VI. **HELENIOIDEÆ.** Ray-flowers yellow, receptacle naked or bristly, pappus chaffy.
27. **Dysodia.** Leaves opposite, pinnately parted.
28. **Helenium.** Leaves alternate, decurrent.
- VII. **ANTHEMIDEÆ.** Leaves alternate, ray-flowers white or none, pappus none.
- Rays present (*a*)
- a.* Disk-flowers white 29
- a.* Disk-flowers yellow 30, 31
- Rays none 32, 33
29. **Achillea.** Receptacle chaffy.
30. **Maruta.** Ray-flowers neutral.
31. **Leucanthemum.** Ray-flowers pistillate.
32. **Tanacetum.** Heads corymbose.
33. **Artemesia.** Heads in paniced spikes.
- VIII. **SENECIONIDEÆ.** Leaves alternate, receptacle naked.
- Rays none 34, 35
- Rays present 36
34. **Erechthites.** Leaves sessile.
35. **Cacalia.** Leaves petiolate.
36. **Senecio.** Rays yellow, pistillate.
- IX. **CYNAROIDEÆ.** Leaves alternate, receptacle bristly, flowers all tubular, purplish.
- Leaves not prickly 37
- Leaves prickly 38, 39
37. **Lappa.** Leaves large, ovate, petiolate.
38. **Cirsium.** Achenium oblong, flattish.
39. **Onopordon.** Achenium 4-angled.

X. **CICHORIACEÆ.** Herbs with milky juice, leaves alternate, receptacle naked, pappus of capillary bristles.

Achenium terete (*a*)

a. Achenium without a beak (*b*)

b. Pappus double, white 40

b. Pappus single, not white 41, 42

a. Achenium with a beak 43

Achenium flattened (*c*)

c. Achenium with a beak 44, 45

c. Achenium without a beak 46

40. **Cynthia.** Stem-leaves 1 or 2, flowers yellow.

41. **Hieracium.** Flowers yellow.

42. **Nabalus.** Flowers whitish or yellowish.

43. **Taraxacum.** Stemless, flowers yellow.

44. **Lactuca.** Flowers yellow or purplish.

45. **Mulgedium.** Flowers bluish.

46. **Sonchus.** Flowers yellow.